storage of the data in said buffer memory until the second syndrome calculating means detects an error-containing code;

an error-detecting-means switch means for switching between the first error detection means and the second error detection means in said data units in a manner that after the second syndrome calculating means detects an error-containing code, said storing means is provided with the mid-term results of the calculation by the second error detecting means of code words until said error-containing code is detected, and on and after the second-time error correction in a same direction, after the second syndrome calculating means detects an error-containing code, said storing means is provided with the mid-term results of the calculation by the second error detecting means of code words until said error-containing code is detected;

an error correcting means for performing error correction after one of the first error detecting means and the second error detecting means detects an error-containing code word;

a parallel transfer means for, on and after the second-time error correction in the same direction, before the first syndrome calculating means detects an error-containing code, transferring data stored in said buffer memory, starting at a code word which is not stored in said storing means to the first syndrome calculating means and to the first error detecting means; and

a second-time onward detecting-processed data use means for, on and after the second-time error detection in the same direction by the second error detecting means, performing error detection of the subsequent code

words by using the mid-term results stored in said storing means.

30. An error correction device which performs error correction for data in a plurality of ECC blocks each having a structure where error correcting code words each comprising a data unit and a parity unit are arranged in vertical and horizontal directions so as to realize repeated error correction, and predetermined data composed of a predetermined number of code words in the vertical or horizontal direction (data in the horizontal direction are referred to as sector) are as one unit subjected to concurrent or parallel error correction by pipeline processing, and which also perform syndrome calculation and error detection in parallel with a storage of demodulated codes in a buffer memory, said error correction device comprising:

a buffer memory for storing ECC blocks to be processed in pipeline, on a block-by-block basis;

a first syndrome calculating means for performing syndrome calculation;

a first error detecting means which pairs up with the first syndrome calculating means;

a second syndrome calculating means for performing syndrome calculation;

a storing means for storing the mid-term results of the calculation done by the first error detecting means and the second error detecting means in predetermined data units of the ECC blocks in process such as ECC block units, sector units, or sector group units;

a demodulated-code calculation selecting means for making one of the first syndrome calculating means and the second syndrome calculating means execute syndrome calculation for demodulated data transmitted from upstream, and making the other syndrome calculating means execute syndrome calculation when there are data stored in said buffer memory;

a buffer memory parallel transfer means for, before the syndrome calculating means selected by said demodulated-code calculation selecting means detects an error-containing code, sequentially transferring data from upstream to the syndrome calculating means and the error detecting means which pairs up therewith, and at the same time storing the data in said buffer memory;

an error-detecting-means switch means for switching between the first error detection means and the second error detection means in a manner that after the syndrome calculating means selected by said demodulated-code calculation selecting means detects an error-containing code in data transmitted from upstream in said data units, said storing means is provided with the mid-term results of the calculation by the corresponding error detecting means of code words until said error-containing code is detected, and on and after the second-time error correction in a same direction, after the corresponding second syndrome calculating means detects an error-containing code, said storing means is provided with the mid-term results of the calculation by the corresponding error detecting means of code words until said error-containing code is detected;

an error correcting means for performing error correction after the